

EQUIPMENT LIST						CO ₂ SYSTEM LEGEND				NOTES	REVISIONS				
TAG No.	ITEM	QTY.	CAPACITY (EA)	SPECIFICATION	COMMENTS	PROTECTED SPACE	SYMBOL	DESCRIPTION	REFERENCES	1. THE FABRICATION, LAYOUT, AND INSTALLATION OF THE SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH THE LR RULES AND REGULATIONS FOR THE CLASSIFICATION OF NAVAL SHIPS JANUARY 2022, AND VESSEL'S CONSTRUCTION SPECIFICATIONS. 2. THE INTENT OF THIS DRAWING IS TO PROVIDE GUIDANCE TO VENDORS FOR THE SELECTION AND SPECIFICATION OF A FIXED GAS CO ₂ FIRE FIGHTING SYSTEM. CALCULATIONS, CYLINDER SIZING AND CYLINDER LOCATION TO BE CONFIRMED BY VENDOR. PIPE SIZES, AND TYPE, LOCATION AND NUMBER OF NOZZLES TO BE CONFIRMED BY VENDOR. 3. ALL FIRE FIGHTING EQUIPMENT AND INSTALLATIONS SHALL BE COMPLIANT WITH THE REQUIREMENTS OF THE SOLAS, REGULATION 10 - FIRE FIGHTING AND FFS CODE CHAPTER 5. 4. FIXED GAS SYSTEM SHALL BE COMPLIANT WITH MSC/CIRC.848 - REVISED GUIDELINES FOR THE APPROVAL OF EQUIVALENT FIXED GAS FIRE-EXTINGUISHING SYSTEMS AS AMENDED BY MSC.1/CIRC.1267. 5. AREAS OF PROTECTED SPACES INDICATED ARE GROSS AREA ESTIMATES ONLY AND SHALL BE CONFIRMED BY THE SHIPYARD IN DETAIL DESIGN. 6. VOLUMES OF PROTECTED SPACES INDICATED ARE GROSS VOLUME ESTIMATES ONLY AND SHALL BE CONFIRMED BY THE SHIPYARD IN DETAIL DESIGN. 7. COMPRESSED AIR TANK PRESSURE RELIEF VALVE DISCHARGES ARE TO BE PIPED TO ATMOSPHERE AND ARE THEREFORE NOT CONSIDERED IN THE COMPARTMENT VOLUME CALCULATIONS, SEE REFERENCE 3. 8. GALLEY DUCTING CO ₂ SYSTEMS ARE NOT COVERED WITHIN THE SCOPE OF THIS DRAWING.	ZONE	REV	DESCRIPTION	DRAWN	CHECKED
555-SH-01	CO ₂ CYLINDER BANK - FORWARD AND AFT ENGINE ROOMS	1	45 kg PER CYLINDER	12 CYLINDERS	SEE NOTE 2			CO ₂ SYSTEM PROTECTED SPACE	SOLAS REG.10 FSS CODE		-	0	INITIAL ISSUE	AJM	KVN
555-SH-02	CO ₂ CYLINDER BANK - EMERGENCY GENSET ROOM	1	34 kg PER CYLINDER	1 CYLINDER	SEE NOTE 2		-	CO ₂ SYSTEM LOCKER	-						
555-SH-03	CO ₂ CYLINDER BANK - PAINT LOCKER	1	20 kg PER CYLINDER	1 CYLINDER	SEE NOTE 2										
555-SH-04	CO ₂ CYLINDER BANK - BATTERY ROOM	1	20 kg PER CYLINDER	1 CYLINDER	SEE NOTE 2										

CALCULATIONS				
CO ₂ PROTECTED SPACES				
COMPARTMENT NAME	PROTECTION	DECK AREA (m ²) (SEE NOTE 5)	DECK HEIGHT (m)	COMPARTMENT VOLUME (m ³) (SEE NOTE 6)
FORWARD ENGINE ROOM	CO ₂ FLOODING	-	-	473.0
FORWARD ENGINE ROOM EXHAUST CASING	CO ₂ FLOODING	12.4	13.0	161.2
AFT ENGINE ROOM	CO ₂ FLOODING	-	-	337.0
AFT ENGINE ROOM EXHAUST CASING	CO ₂ FLOODING	4.2	13.0	54.6
EMERGENCY GENSET ROOM	CO ₂ FLOODING	13.0	2.8	36.4
BATTERY ROOM	CO ₂ FLOODING	5.0	3.4	17.0
PAINT LOCKER	CO ₂ FLOODING	3.2	4.0	12.8

FORWARD ENGINE ROOM CO₂ FLOODING SYSTEM (FSS CODE - FIRE SAFETY SYSTEMS - RESOLUTION MSC.98(73) - ANNEX - INTERNATIONAL CODE FOR FIRE SAFETY SYSTEMS - CHAPTER 5 - FIXED GAS FIRE-EXTINGUISHING SYSTEMS):

MACHINERY SPACE = FORWARD ENGINE ROOM

FORWARD ENGINE ROOM GROSS VOLUME = 473.0 m³
 FORWARD ENGINE ROOM EXHAUST CASING GROSS VOLUME = 161.2 m³
 FORWARD ENGINE ROOM STARTING AIR RECEIVERS (FREE AIR VOLUME) = 0.0 m³

CASE 1 - 40% GROSS VOLUME EXCLUDING THE EXHAUST CASING
 TOTAL COMPARTMENT VOLUME CONSIDERED = 473.0 m³
 REQUIRED CO₂ SYSTEM VOLUME = 189.2 m³

CASE 2 - 35% GROSS VOLUME INCLUDING THE EXHAUST CASING
 TOTAL COMPARTMENT VOLUME CONSIDERED = 634.2 m³
 REQUIRED CO₂ SYSTEM VOLUME = 222.0 m³

LARGEST REQUIRED CO₂ VOLUME OF CASE 1 AND CASE 2 = 222.0 m³

CO₂ BOTTLE SIZE = 45 kg
 QUANTITY OF CO₂ BOTTLES REQUIRED = 8.8 Nos.
 QUANTITY OF CO₂ BOTTLES PROVIDED = 12 Nos.

AFT ENGINE ROOM CO₂ FLOODING SYSTEM (FSS CODE - FIRE SAFETY SYSTEMS - RESOLUTION MSC.98(73) - ANNEX - INTERNATIONAL CODE FOR FIRE SAFETY SYSTEMS - CHAPTER 5 - FIXED GAS FIRE-EXTINGUISHING SYSTEMS):

MACHINERY SPACE = AFT ENGINE ROOM

AFT ENGINE ROOM GROSS VOLUME = 337.0 m³
 AFT ENGINE ROOM EXHAUST CASING GROSS VOLUME = 54.6 m³
 AFT ENGINE ROOM STARTING AIR RECEIVERS (FREE AIR VOLUME) = 0.0 m³

CASE 1 - 40% GROSS VOLUME EXCLUDING THE EXHAUST CASING
 TOTAL COMPARTMENT VOLUME CONSIDERED = 337.0 m³
 REQUIRED CO₂ SYSTEM VOLUME = 134.8 m³

CASE 2 - 35% GROSS VOLUME INCLUDING THE EXHAUST CASING
 TOTAL COMPARTMENT VOLUME CONSIDERED = 391.6 m³
 REQUIRED CO₂ SYSTEM VOLUME = 137.1 m³

LARGEST REQUIRED CO₂ VOLUME OF CASE 1 AND CASE 2 = 137.1 m³

CO₂ BOTTLE SIZE = 45 kg
 QUANTITY OF CO₂ BOTTLES REQUIRED = 5.4 Nos.
 QUANTITY OF CO₂ BOTTLES PROVIDED = 12 Nos.

EMERGENCY GENSET ROOM CO₂ FLOODING SYSTEM (FSS CODE - FIRE SAFETY SYSTEMS - RESOLUTION MSC.98(73) - ANNEX - INTERNATIONAL CODE FOR FIRE SAFETY SYSTEMS - CHAPTER 5 - FIXED GAS FIRE-EXTINGUISHING SYSTEMS):

EMERGENCY GENSET ROOM GROSS VOLUME = 36.4 m³

CASE 1 - 40% GROSS VOLUME EXCLUDING THE EXHAUST CASING
 TOTAL COMPARTMENT VOLUME CONSIDERED = 36.4 m³
 REQUIRED CO₂ SYSTEM VOLUME = 14.6 m³

CASE 2 - 35% GROSS VOLUME INCLUDING THE EXHAUST CASING
 TOTAL COMPARTMENT VOLUME CONSIDERED = 36.4 m³
 REQUIRED CO₂ SYSTEM VOLUME = 12.7 m³

LARGEST REQUIRED CO₂ VOLUME OF CASE 1 AND CASE 2 = 14.6 m³

CO₂ BOTTLE SIZE = 34 kg
 QUANTITY OF CO₂ BOTTLES REQUIRED = 0.8 Nos.
 QUANTITY OF CO₂ BOTTLES PROVIDED = 1 Nos.

PAINT LOCKER CO₂ FLOODING SYSTEM (SOLAS CHAPTER II-2, PART C, REGULATION 10.6.3.1):

PAINT LOCKER GROSS VOLUME = 12.8 m³

40% OF COMPARTMENT GROSS VOLUME = 5.1 m³
 REQUIRED CO₂ SYSTEM VOLUME = 5.1 m³

CO₂ BOTTLE SIZE = 20 kg
 QUANTITY OF CO₂ BOTTLES REQUIRED = 0.5 Nos.
 QUANTITY OF CO₂ BOTTLES PROVIDED = 1 Nos.

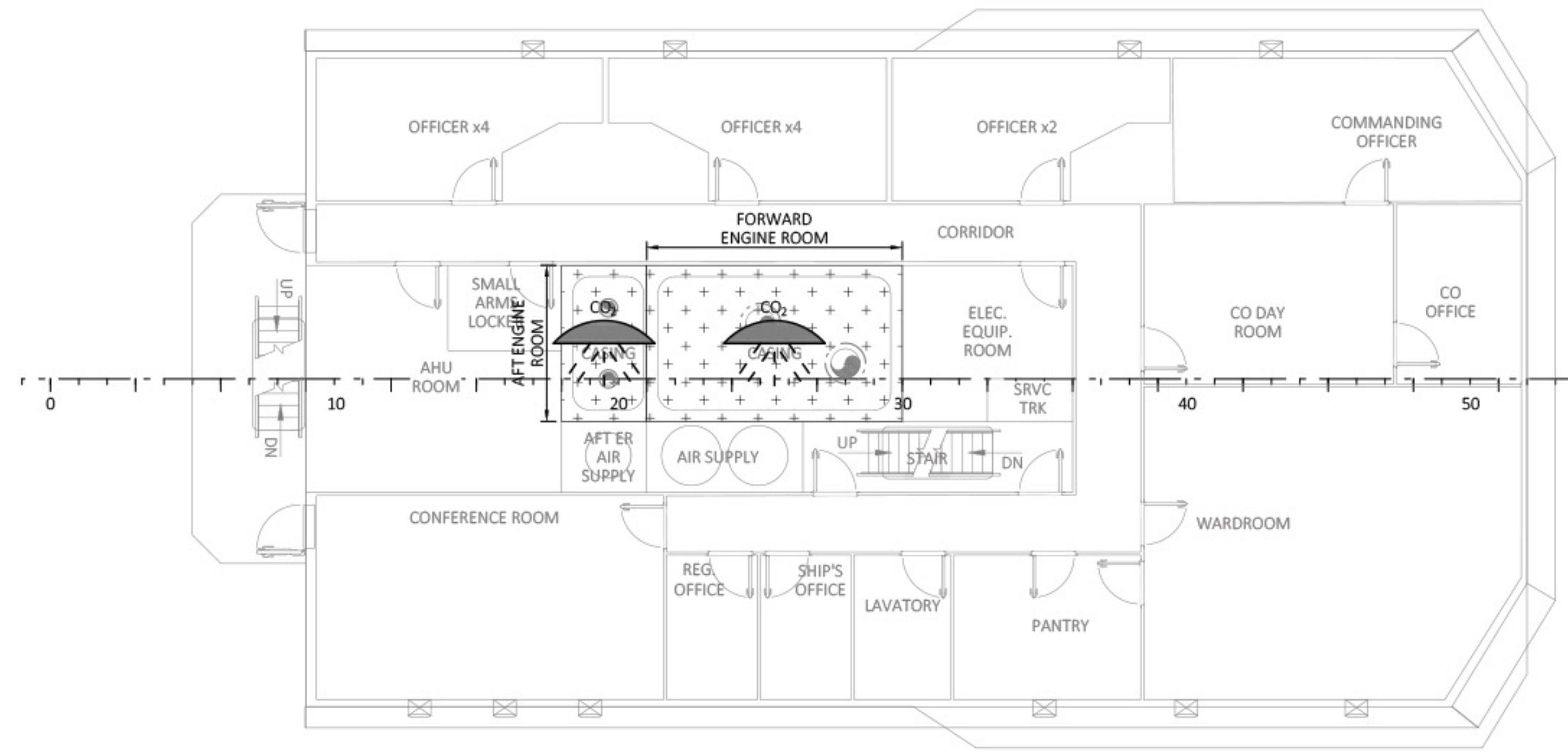
BATTERY ROOM CO₂ FLOODING SYSTEM (SHIP SPECIFICATION - 0358):

BATTERY ROOM GROSS VOLUME = 17.0 m³

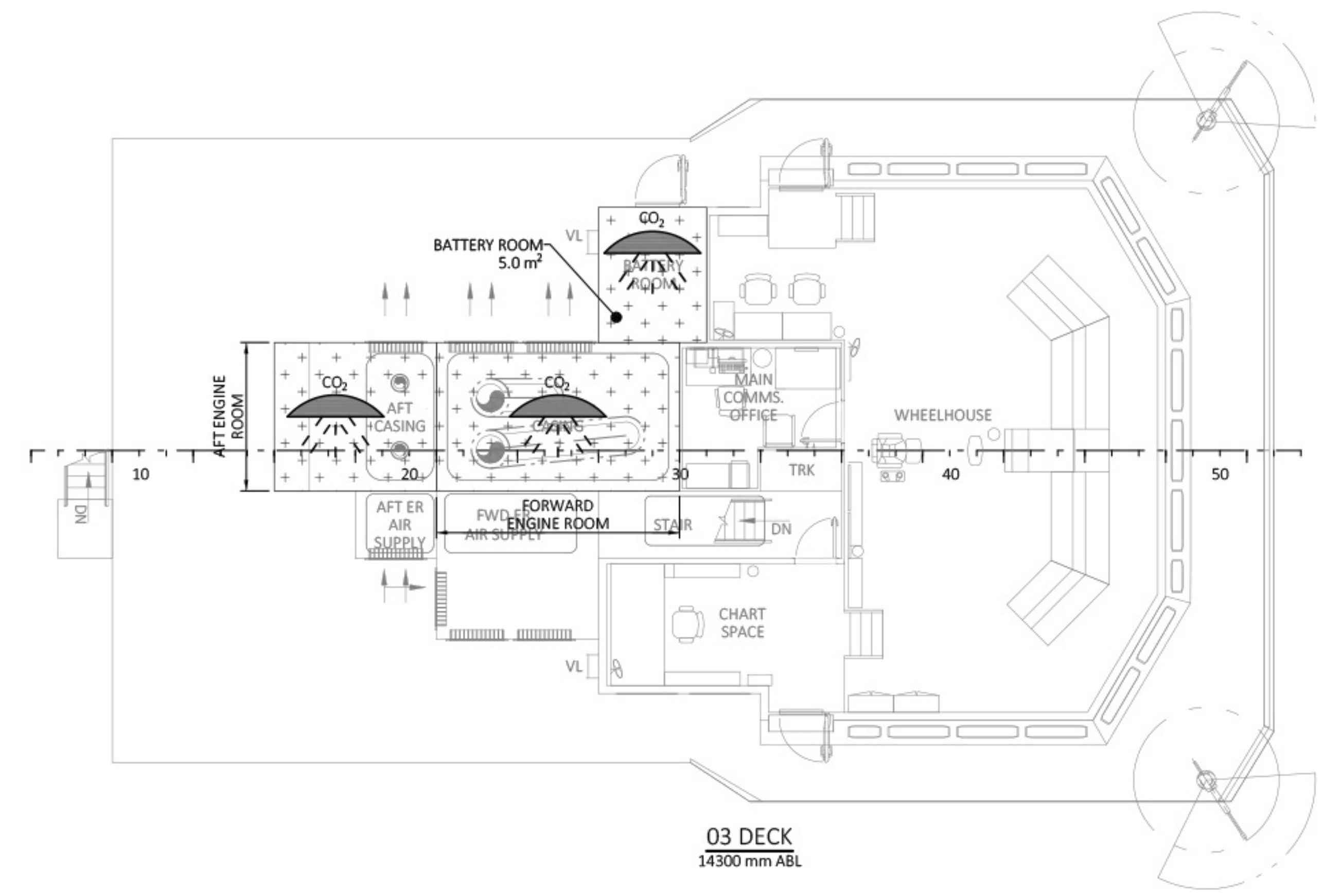
40% OF COMPARTMENT GROSS VOLUME = 6.8 m³
 REQUIRED CO₂ SYSTEM VOLUME = 6.8 m³

CO₂ BOTTLE SIZE = 20 kg
 QUANTITY OF CO₂ BOTTLES REQUIRED = 0.6 Nos.
 QUANTITY OF CO₂ BOTTLES PROVIDED = 1 Nos.

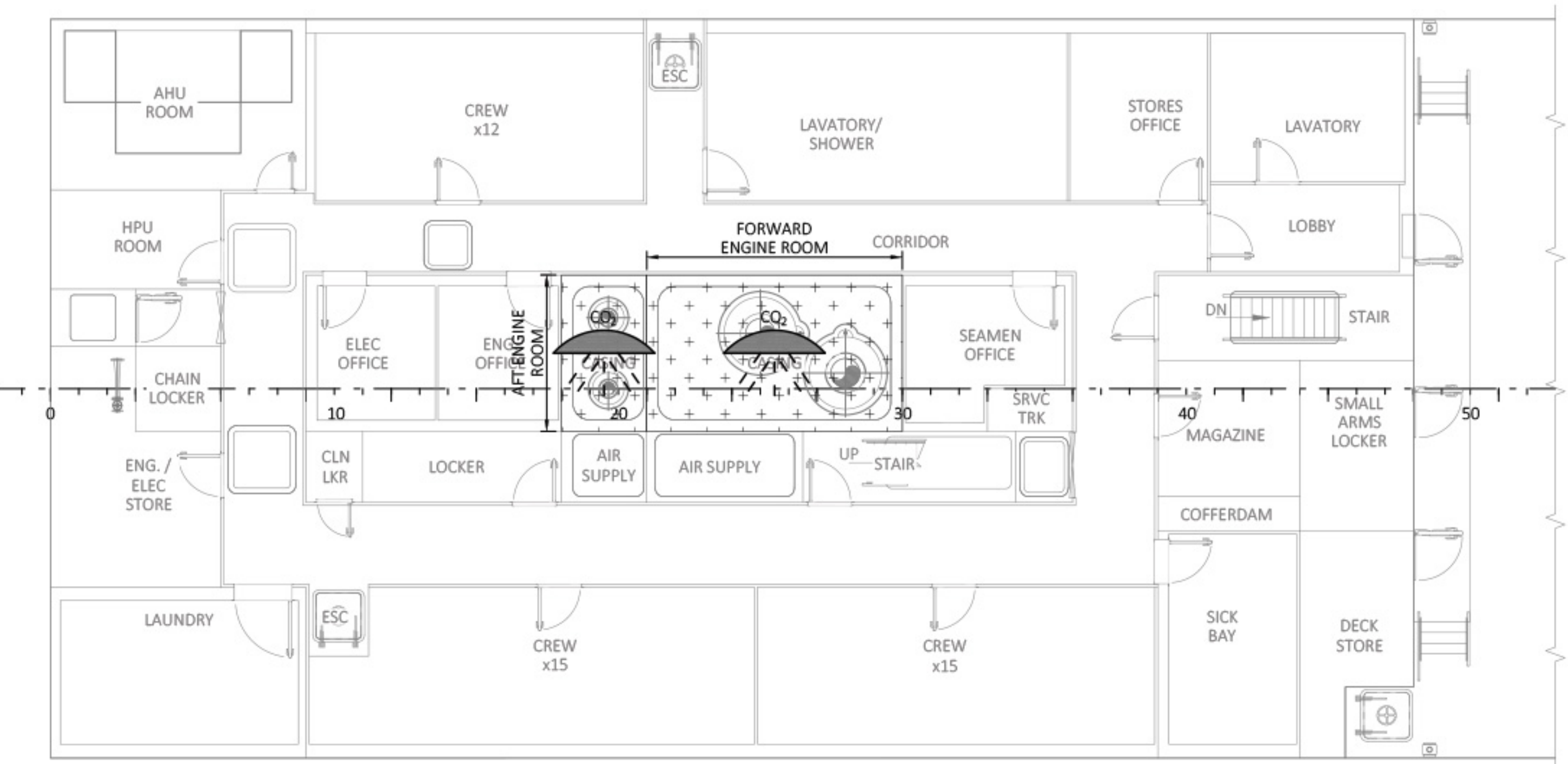
SYMBOL LIST	
	CO ₂ BOTTLE (45 kg, 34 kg OR 20 kg)
	VALVE MOTOR OPERATED
	CO ₂ NOZZLE
	CO ₂ PIPING
	LIGHT SIGNAL FIRE ALARM
	CO ₂ REMOTE RELEASE STATION
	CO ₂ HORN



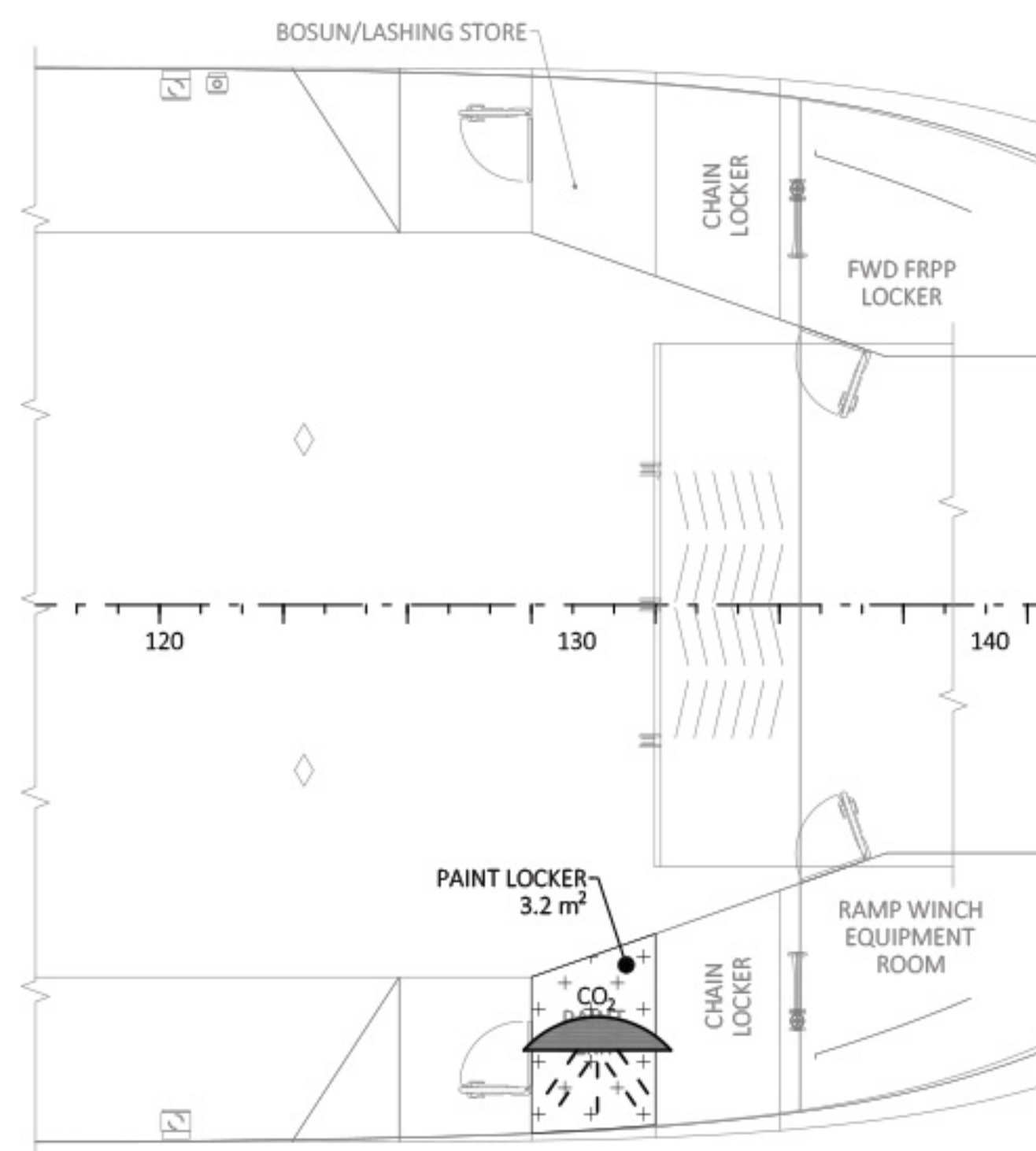
O2 DECK
11500 mm ABL



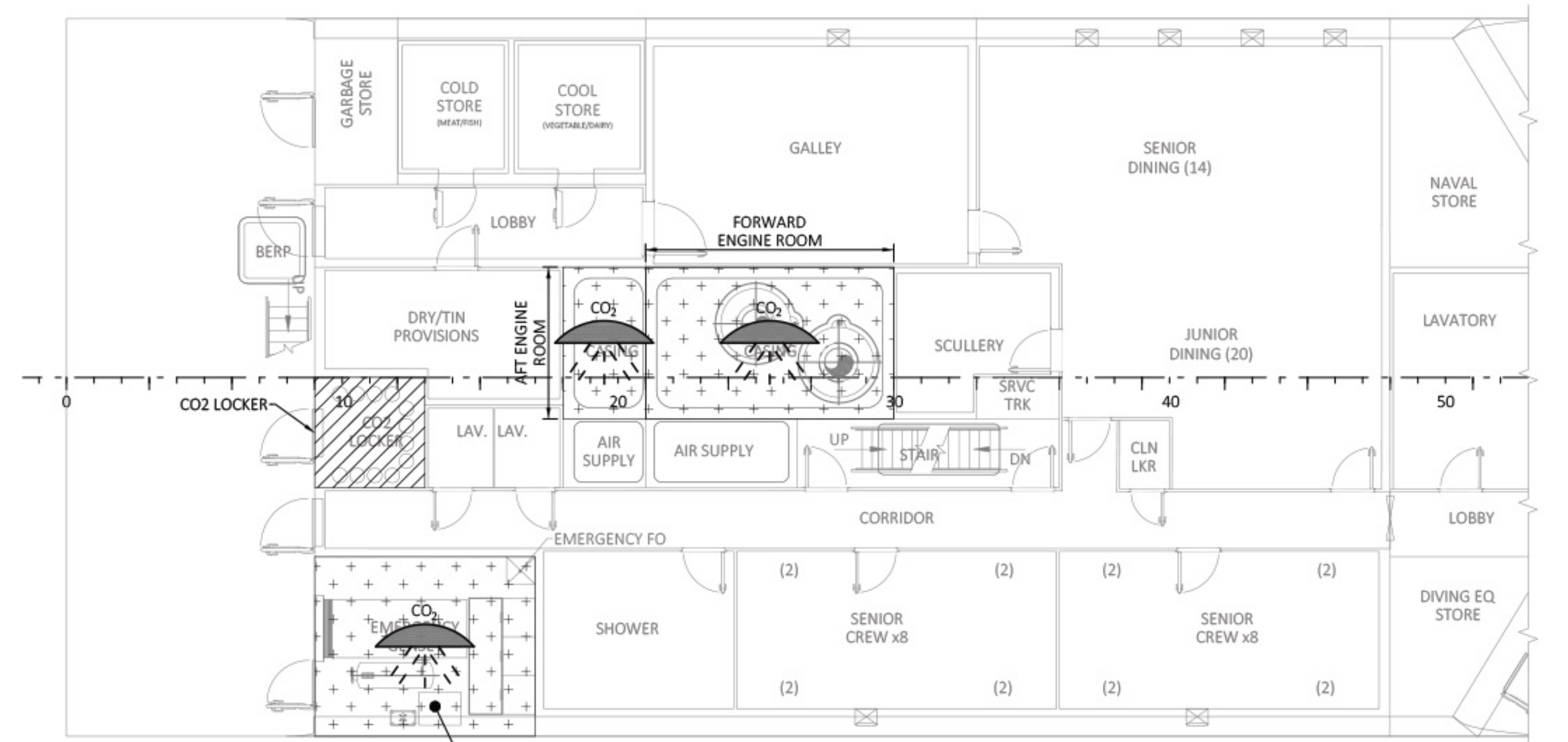
O3 DECK
14300 mm ABL



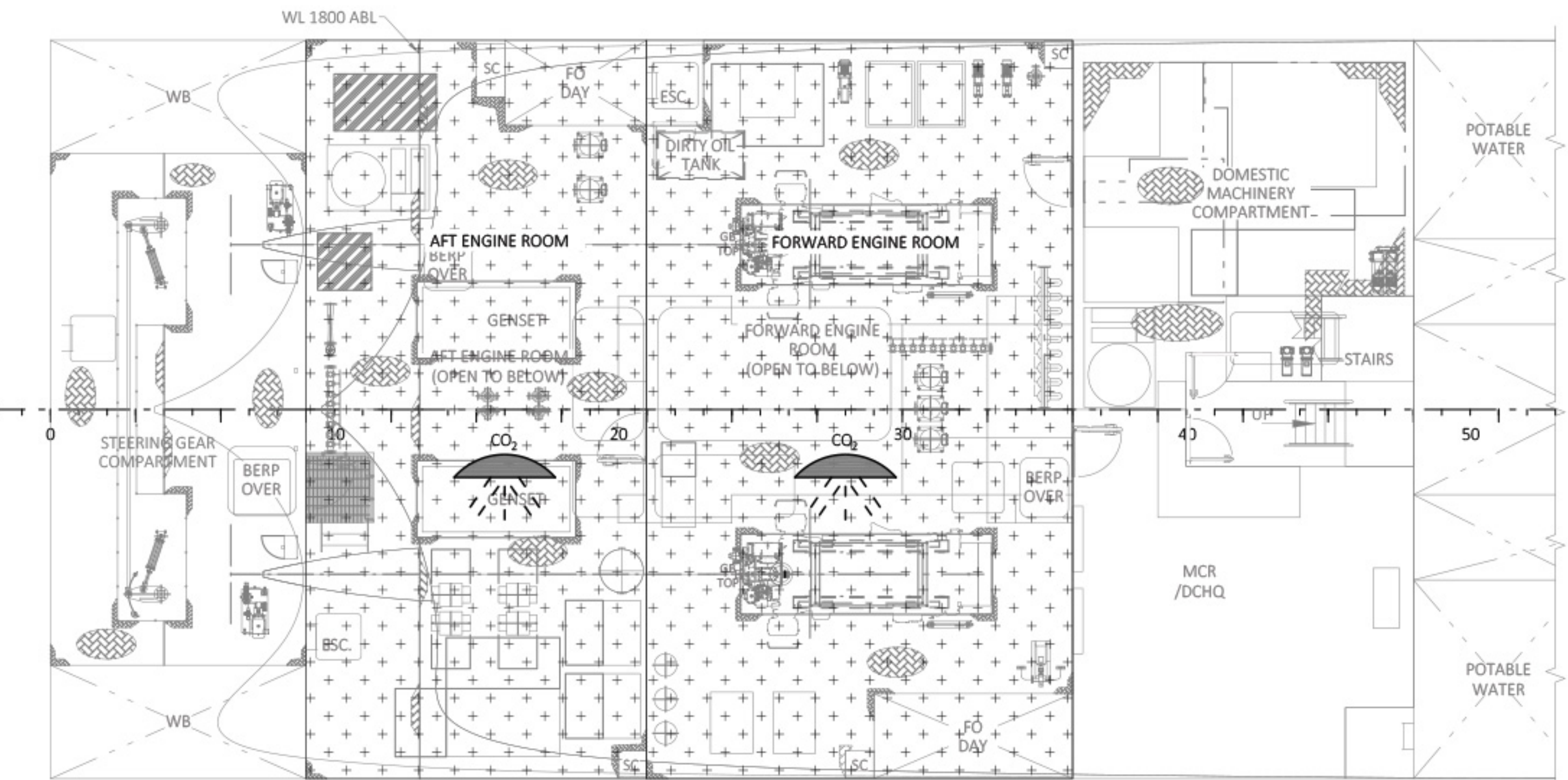
1 DECK
4700 mm ABL



1 DECK
4700 mm ABL



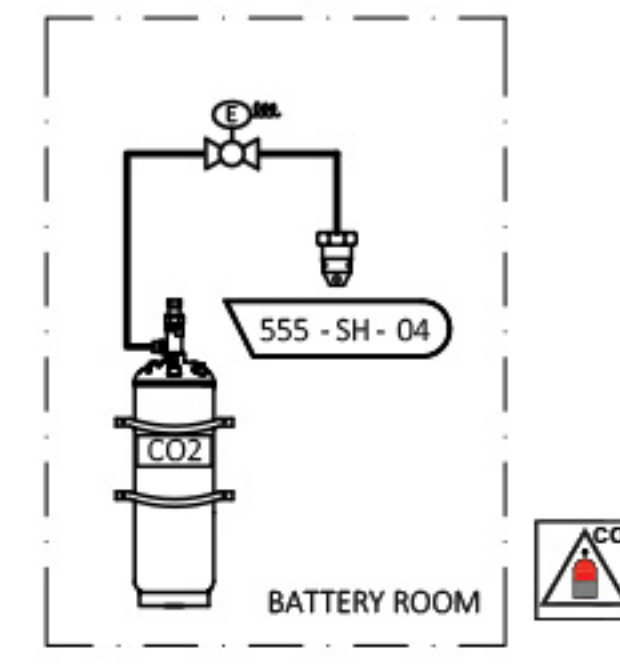
O1 DECK
8700 mm ABL



2 DECK
1200 mm ABL

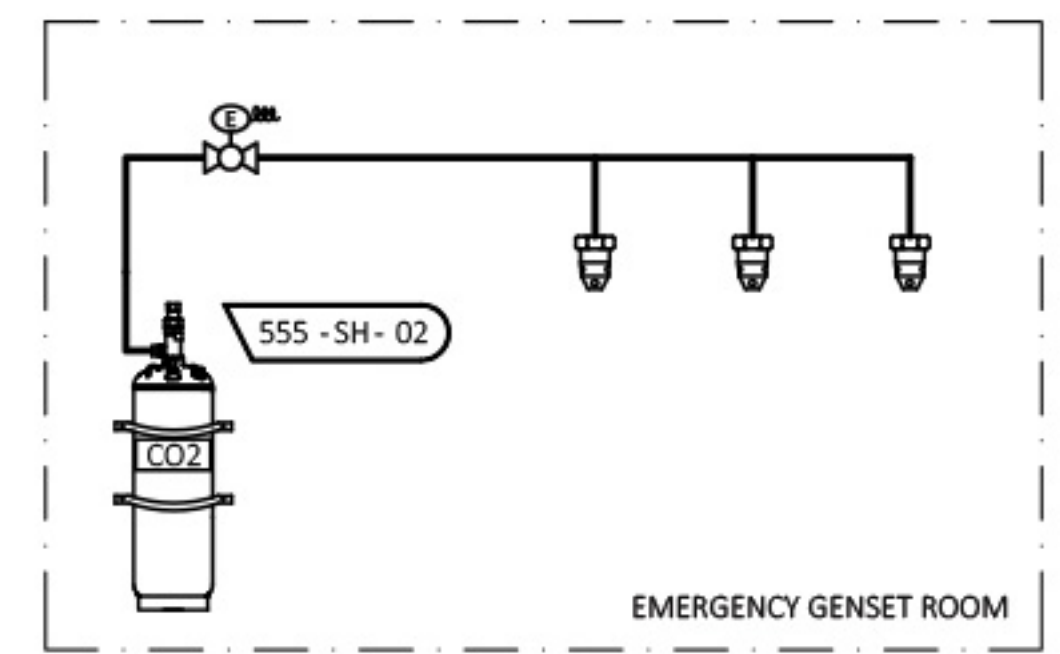
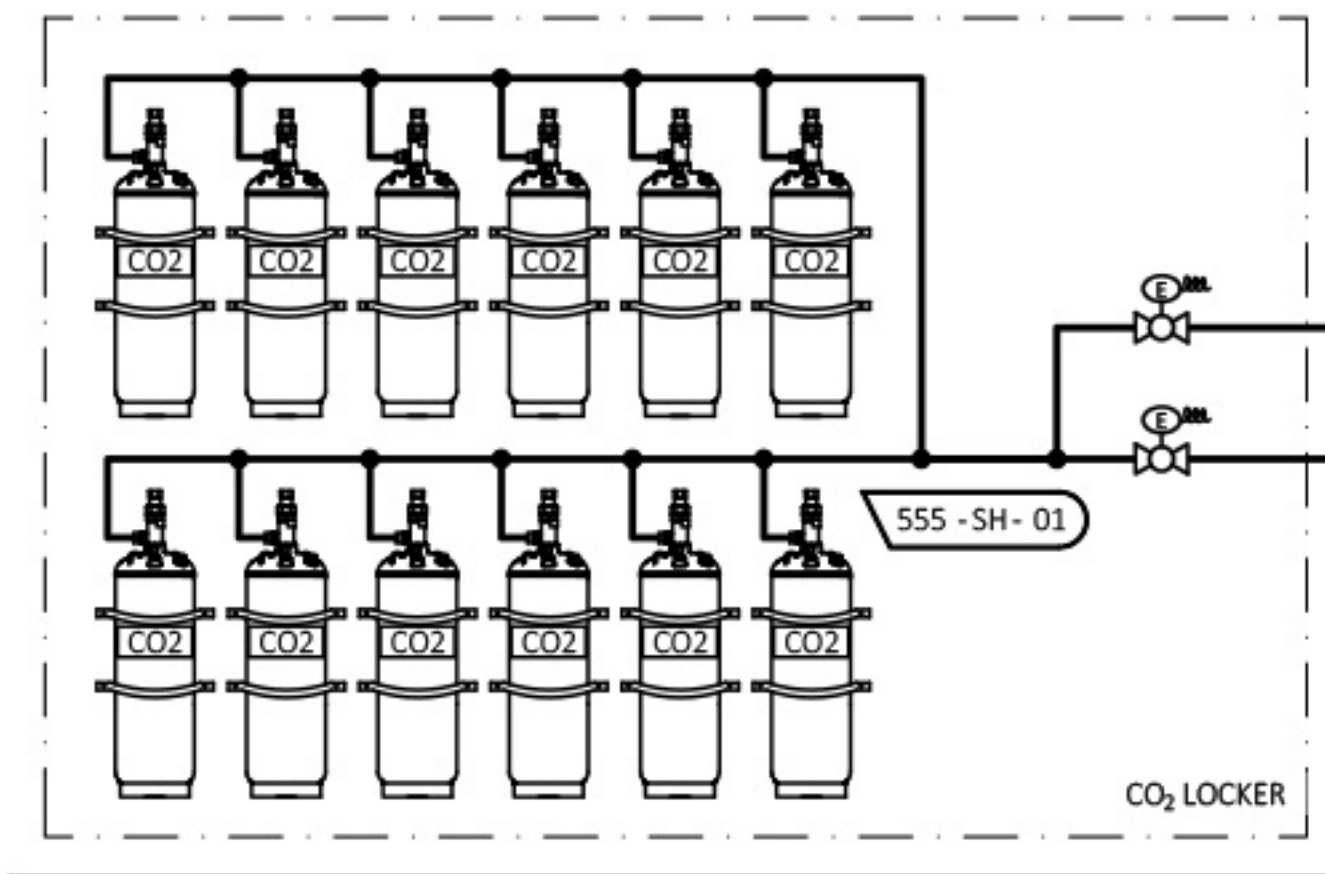
12 11 10 9 8 7 6 5 4 3 2 1

H
G
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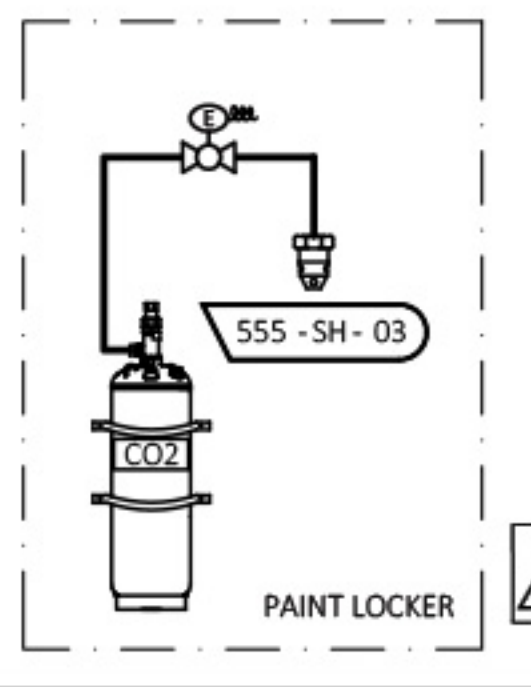
03 DECK
14300 mm ABL

02 DECK
11500 mm ABL



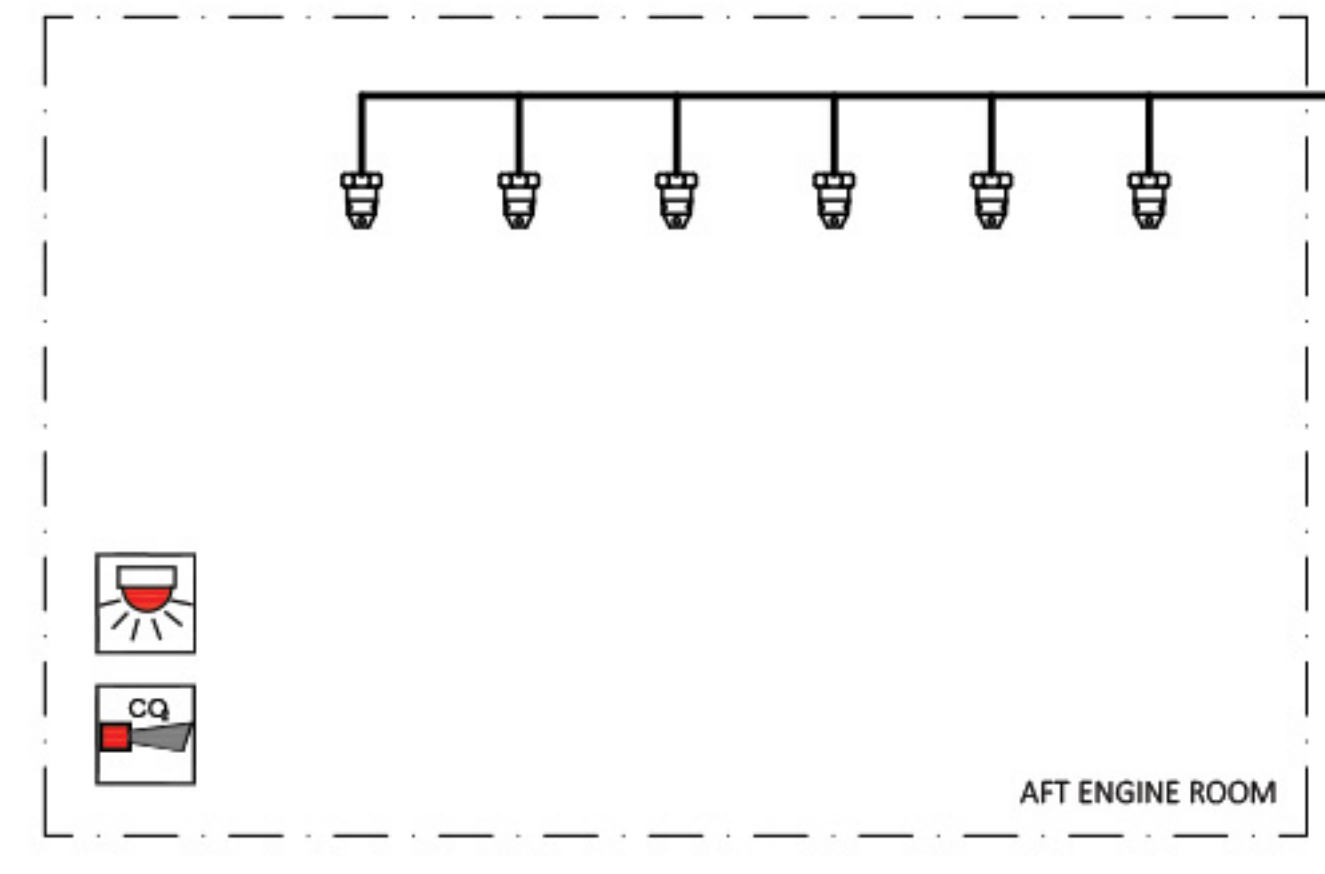
AFT ENGINE ROOM
FWD ENGINE ROOM
EMERGENCY GENSET ROOM

01 DECK
8700 mm ABL

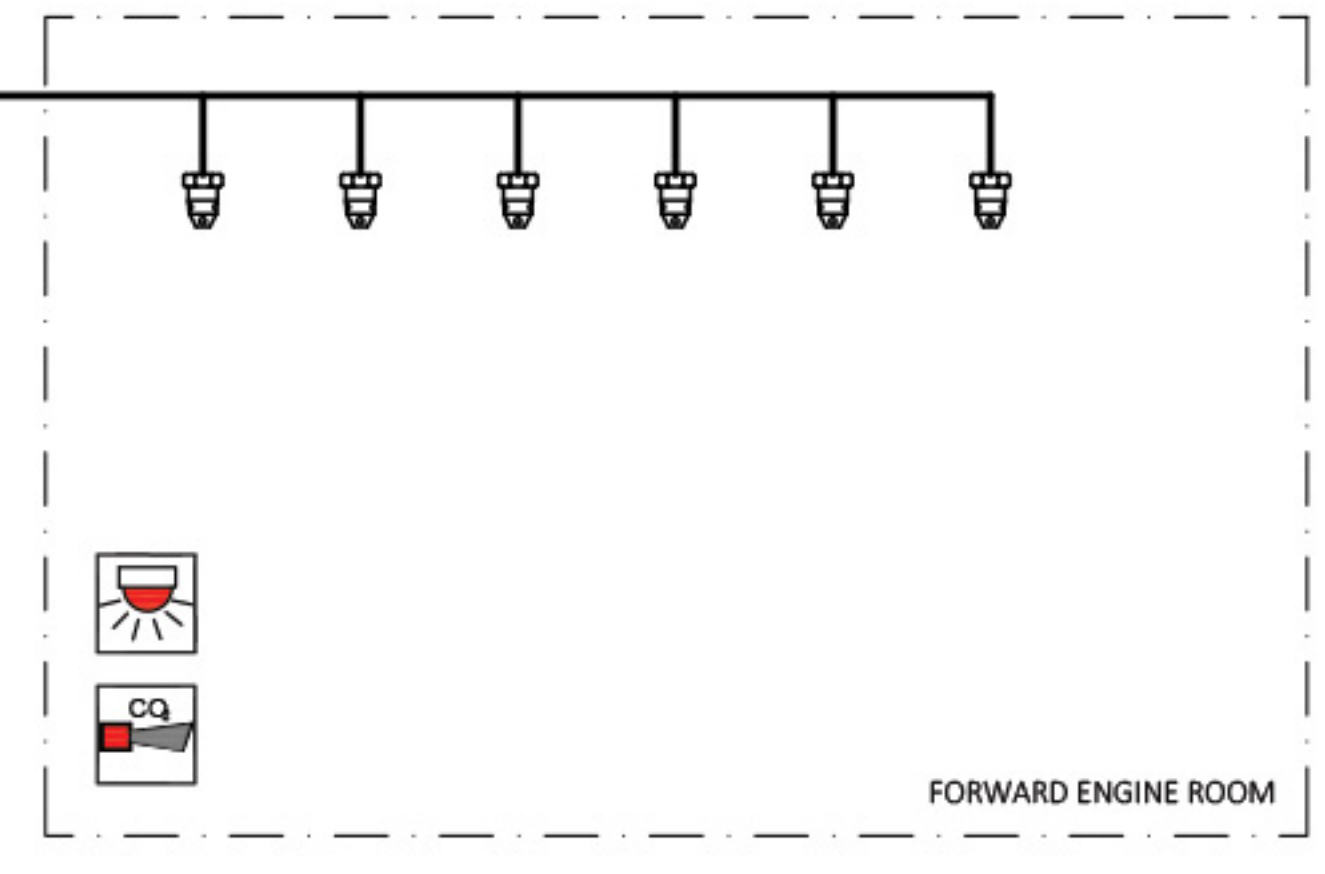


1 DECK (FR. 0-48)
5600 mm ABL

1 DECK
4700 mm ABL



AFT ENGINE ROOM



FWD ENGINE ROOM

2 DECK
1200 mm ABL

12 11 10 9 8 7 6 5 4 3 2 1

PRINCIPAL PARTICULARS:

LENGTH OVERALL: 74.50 m
LENGTH WATERLINE: 72.80 m
BREADTH (MOULDED): 13.00 m
BREADTH WATERLINE: 13.00 m
DESIGN DRAFT (FF): 1.00 m
DESIGN DRAFT (AP): 2.20 m

POWER:
PROPULSION: 2 x 2240 kW
AUXILIARY: 2 x 272 kW
EMERGENCY: 1 x 129 kW

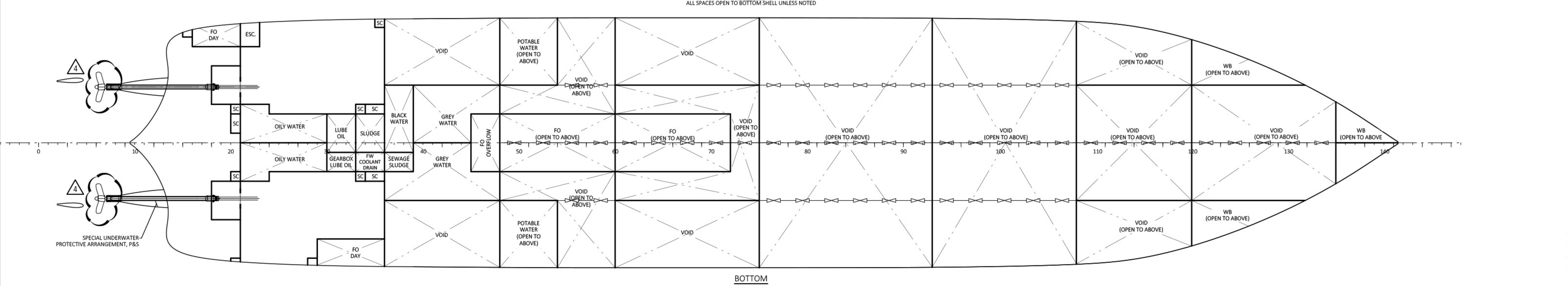
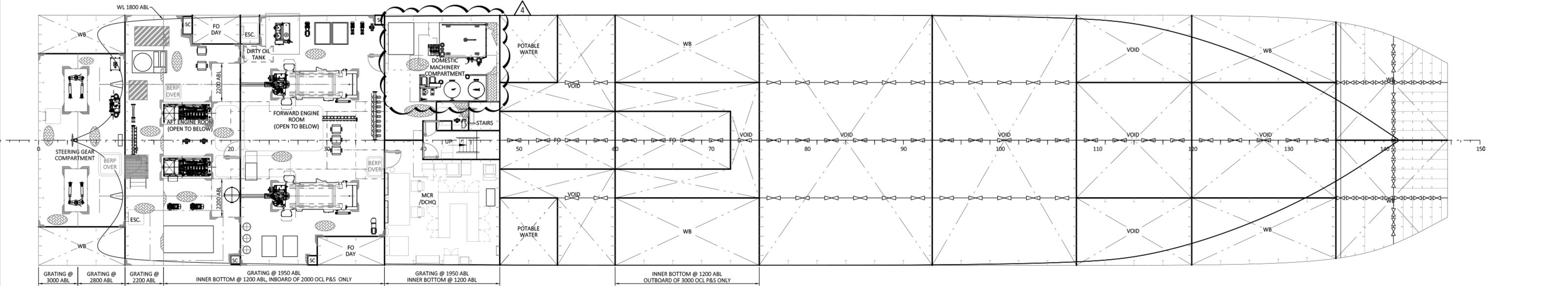
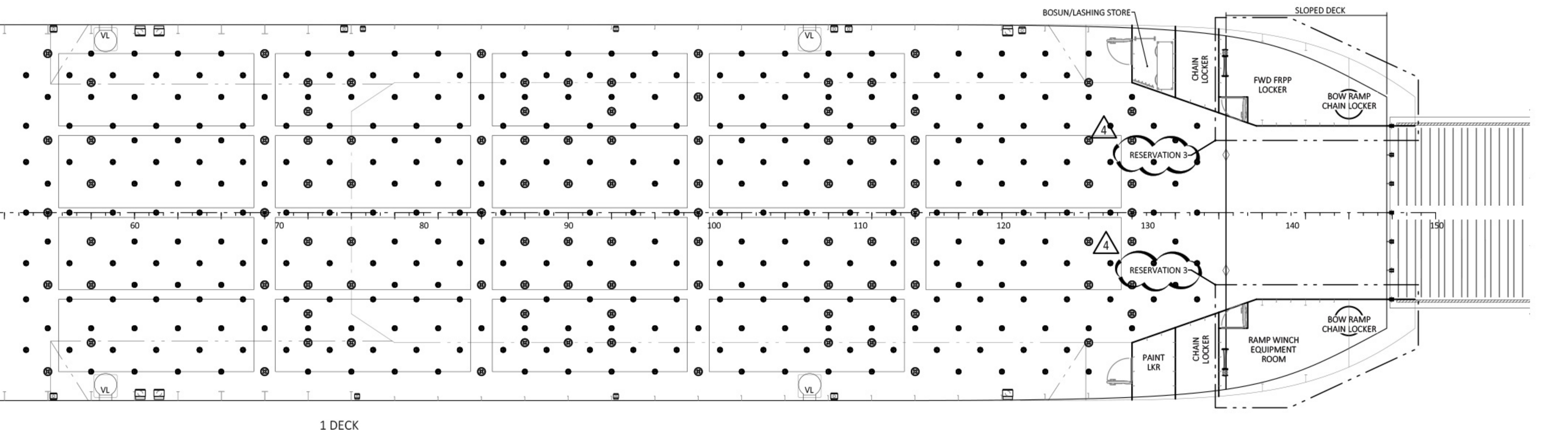
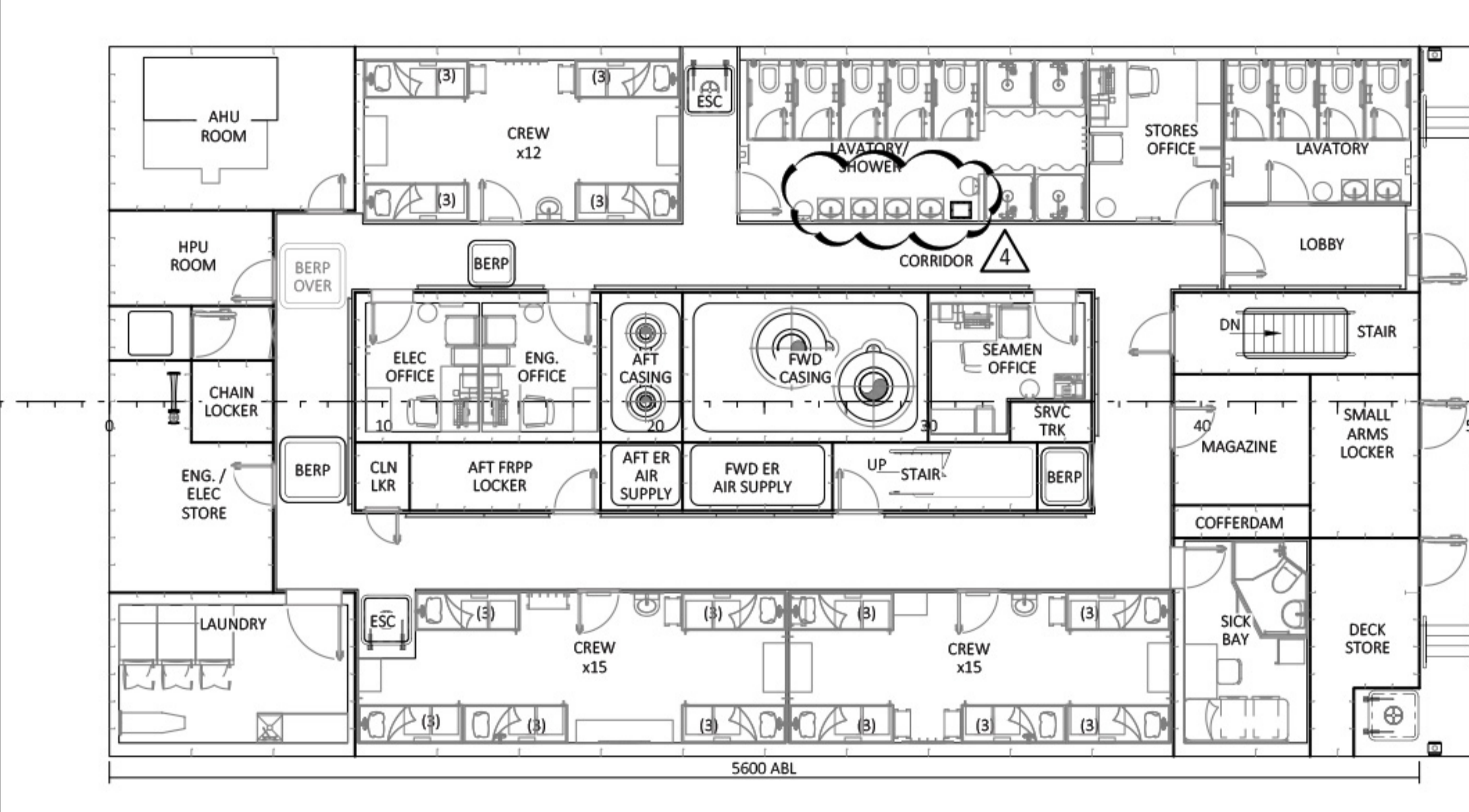
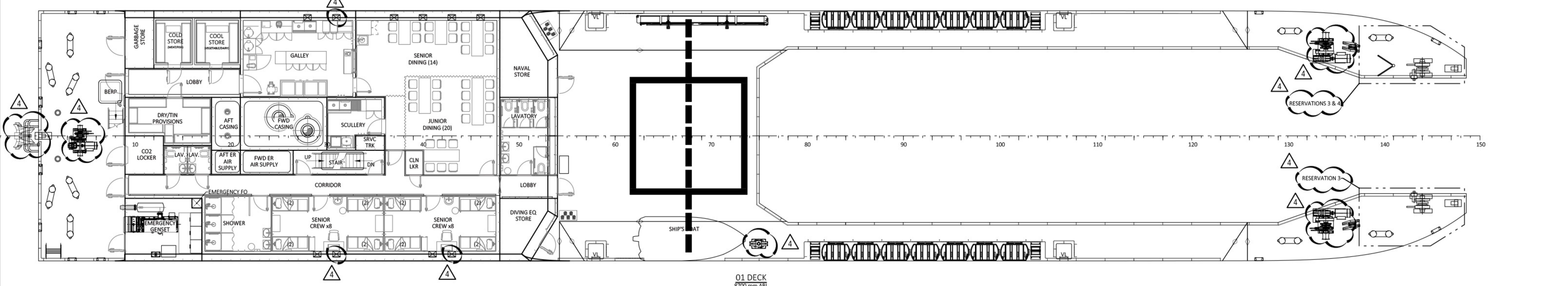
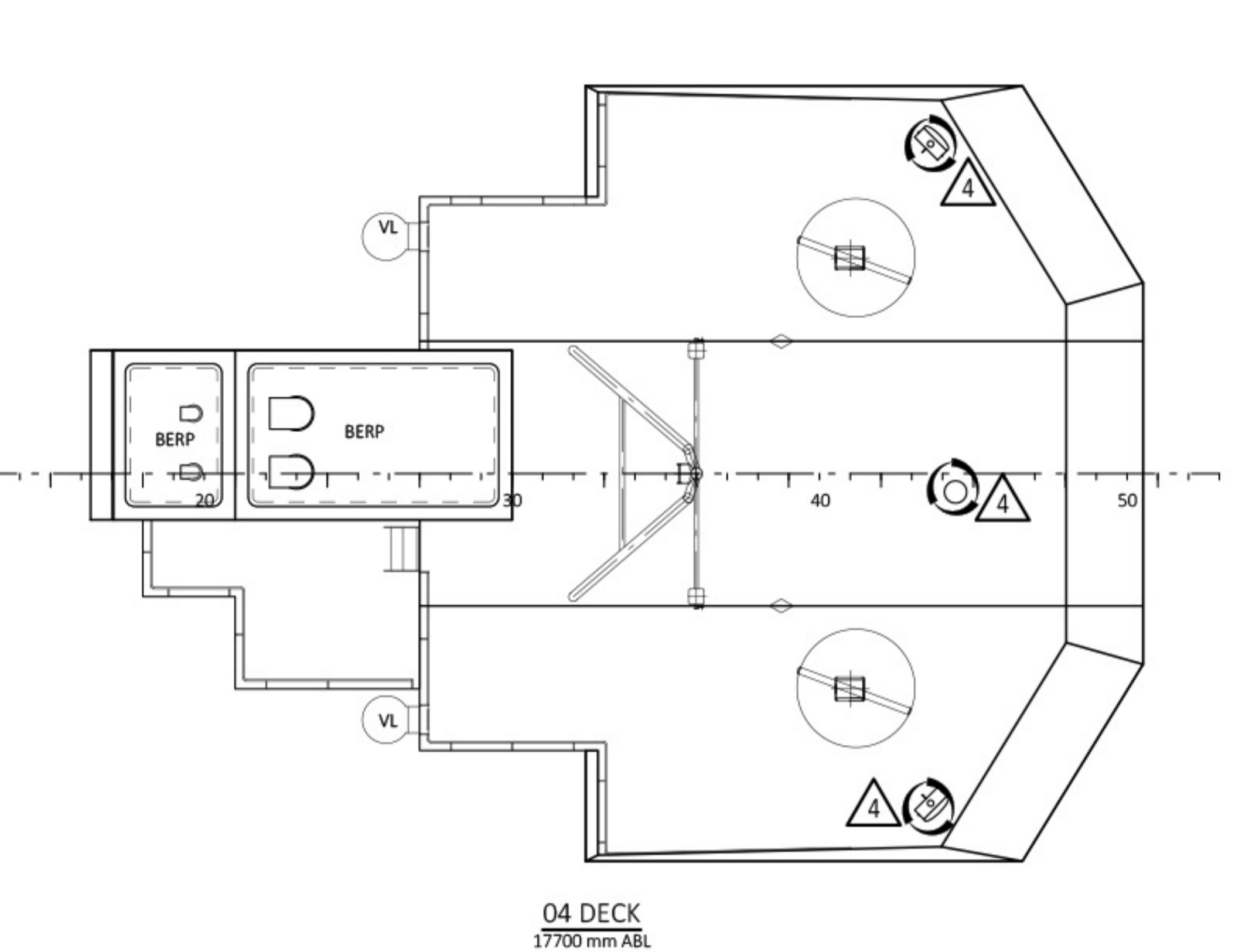
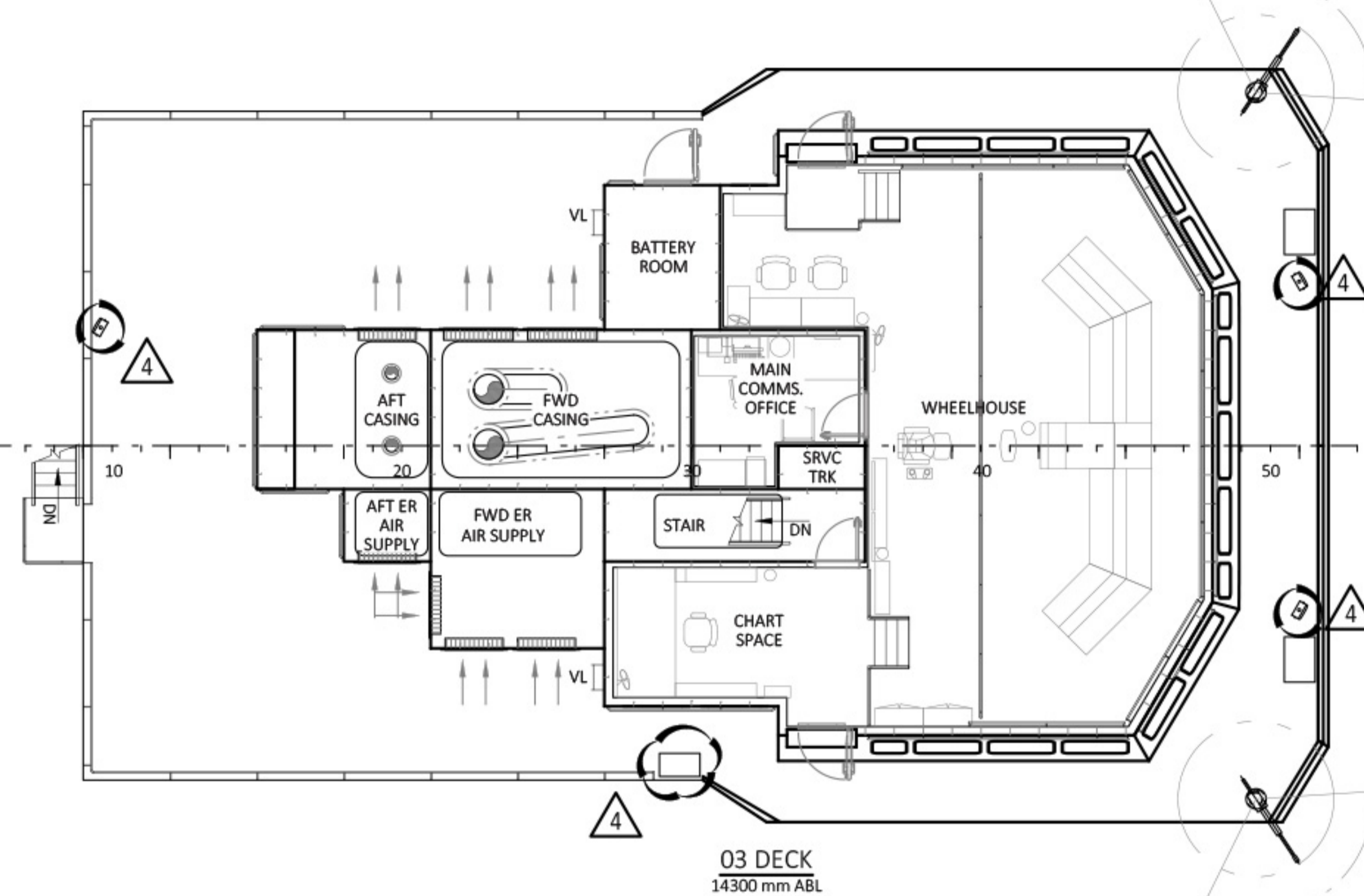
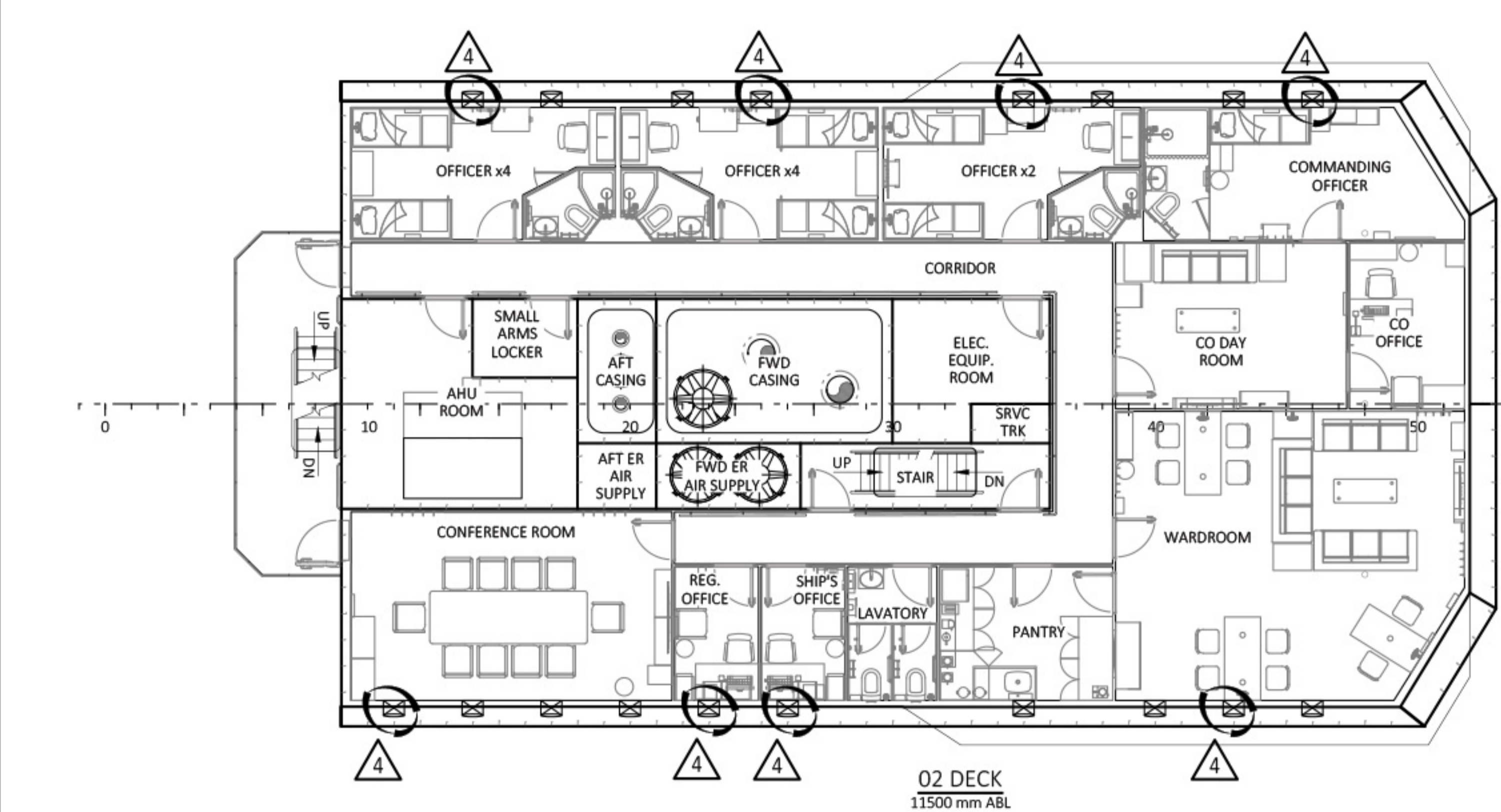
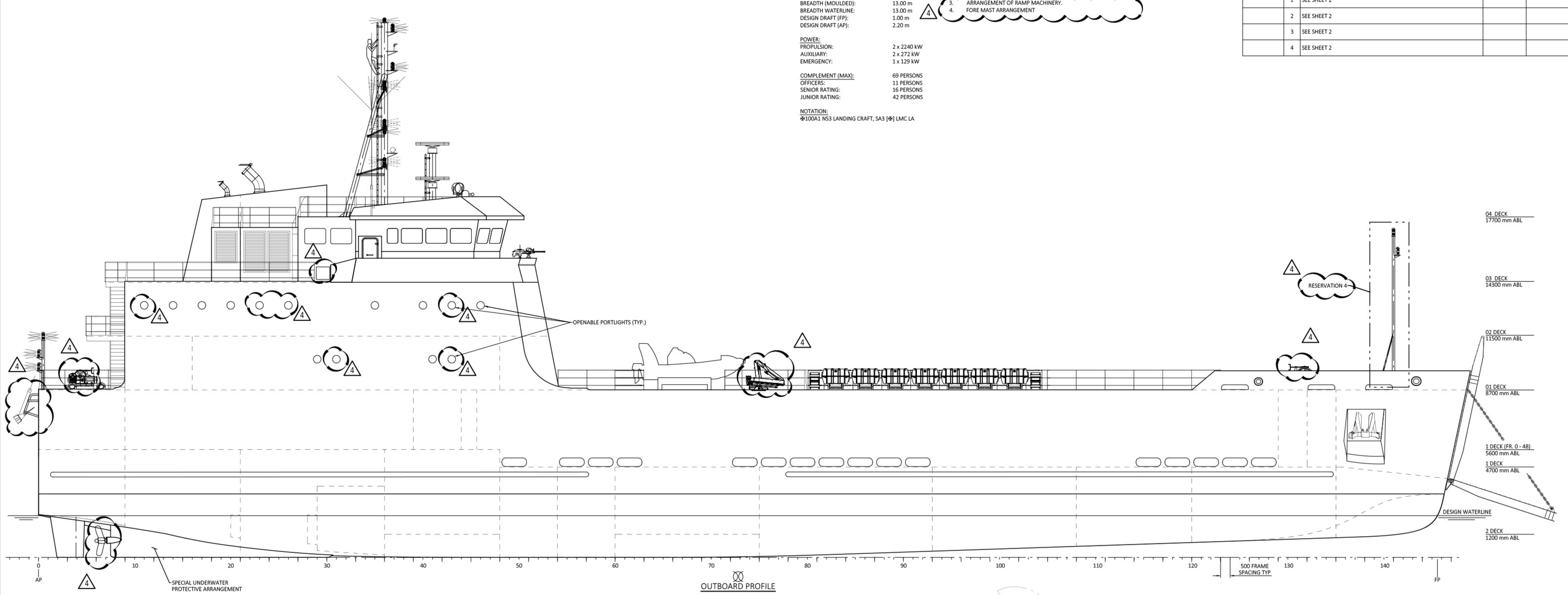
COMPLEMENT (MAX): 69 PERSONS
OFFICERS: 11 PERSONS
SENIOR RATING: 16 PERSONS
JUNIOR RATING: 42 PERSONS

NOTATION:
Ø130x43 R53 LANDING CRAFT, SA3 (H) LMC LA

RESERVATIONS:

- PARTICULARS SUBJECT TO CHANGE BASED ON DESIGN DEVELOPMENT
- ARRANGEMENT OF BEAM MACHINERY
- ARRANGEMENT OF BEAM MACHINERY
- FORE MAST ARRANGEMENT

REVISIONS				
ZONE	REV	DESCRIPTION	DRAWN	CHECKED
	0	INITIAL ISSUE FOR CLIENT REVIEW	JRH	23 JUN 22
	1	SEE SHEET 2		
	2	SEE SHEET 2		
	3	SEE SHEET 2		
	4	SEE SHEET 2		



REVISIONS		DESCRIPTION	DRAWN	CHECKED
1	-	HULL FORM REVISED		
	-	FRAME SPACING CHANGED FROM 600 mm TO 500 mm		
	-	DECKS RENAMED PER EN 2170 STANDARD		
	1-C1, 1-A6	MAIN MAST REVISED		
	1-B2, 1-C6, 1-A6, 1-C9, 1-C11	CASING ARRANGEMENT REVISED FOLLOWING ENGINE ROOM SUBDIVISION		
	1-B3, 1-F5, 1-F7	03 DECK LIFERAFTS REMOVED		
	1-A4	AFT BULKHEADS REMOVED		
	1-E3	ARMAMENT RELOCATED FROM 01 DECK		
	1-E3	BRIDGE WINDOWS REVISED TO UTILIZE ISO WINDOW SIZES		
	1-E3	DECKHOUSE FRONT GEOMETRY REVISED		
2	1-F4	REMOVABLE RAILINGS ADDED		
	1-C4, 1-C11	1 DECK AFT OF FRAME 48 RAISED TO 5600 ABL		
	1-B5	PROPELLER/SECS ARRANGEMENT REVISED		
	1-G1	PRINCIPAL PARTICULARS REVISED		
	1-H4, 1-H8, 1-H9	01 DECK WALKWAY ADDED. LIFERAFTS CHANGED TO SINGLE STACK. VERTICAL LADDERS ADDED		
	1-B3, 1-B8	FORWARD MAST REVISED		
	1-B6	AHU ROOM RELOCATED FROM 1 DECK		
	1-B6	CREW SMALL ARMS LOCKER ADDED		
	1-D6	ELECTRICAL EQUIPMENT ROOM ADDED		
	1-G6, 1-G6, 1-C9, 1-C11	MAIN STARTERTOWER MOVED FROM PORT TO STARBOARD		
3	1-C7	REGULATING OFFICE ADDED		
	1-C7	SHIP'S OFFICE RELOCATED FROM 01 DECK		
	1-C7	SERVICE TRUNK ADDED		
	1-G6, 1-G6, 1-C9, 1-D11	CO DAY ROOM SUBDIVIDED INTO DAY ROOM AND OFFICE		
	1-E6	BATTERY ROOM ENLARGED AND RELOCATED		
	1-G6	MAIN COMMUNICATIONS OFFICE RELOCATED		
	1-H6	WHEELHOUSE FRONT GEOMETRY REVISED		
	1-G5, 1-G7	BRIDGE WINGS ADDED		
	1-K5, 1-K7	CAMBER ADDED TO 04 DECK		
	1-A8	AFT ANCHORING/MOORING/TOWING ARRANGEMENT REVISED		
4	1-B8	GARBAGE STORE ADDED		
	1-B8	DRY/TIN PROVISIONS RELOCATED		
	1-E11, 1-B9	DECK STORE ADDED; CO2 LOCKER RELOCATED TO 01 DECK	ACN 15 DEC 22	MAM 15 DEC 22
	1-B9	LAVATOIRES ADDED		
	1-C6	SCULLERY ADDED		
	1-D9	SENIOR CREW CABINS REARRANGED WITH DOUBLE BERTHS ONLY		
	1-E8	SENIOR/JUNIOR DINING REARRANGED WITH TEMPORARY PARTITIONS. PASSTHROUGH FROM GALLEY TO SENIOR DINING ADDED		
	1-E8	LAVATORY RELOCATED		
	1-B9, 1-E10	BOUNDARY WINGS STORE ADDED. NAVAL STORE RELOCATED TO 01 DECK		
	1-B11, 1-E9	PAINT LOCKER ADDED; DIVING EQUIPMENT STORE RELOCATED TO 01 DECK		
5	1-F9, 1-F7	CAMBER ADDED TO 01 DECK		
	1-K8, 1-K9	FORWARD ANCHORING/MOORING/BOW RAMP ARRANGEMENT REVISED		
	1-A10	HPU ROOM RELOCATED		
	1-B10	AFT CHAIN LOCKER ADDED		
	1-A11	ENGINEERING/ELECTRICAL STORE RELOCATED		
	1-A11	LAUNDRY RELOCATED TO REPLACE STARBOARD AHU ROOM		
	1-B11	AFT DAMAGE CONTROL LOCKER ADDED		
	1-B10	ELECTRICAL OFFICE AND ENGINEERING OFFICE RELOCATED		
	1-C10	LAVATORY RELOCATED AND CONSOLIDATED WITH SHOWER		
	1-D10	STORES OFFICE RELOCATED		
6	1-D11	SICK BAY RELOCATED		
	1-D11	MAGAZINE RELOCATED. COFFERDAMS ADDED AS NECESSARY		
	1-D2, 1-D10	STAIRWAY FROM 1 DECK TO 2 DECK RELOCATED		
	1-E11	TROOP SMALL ARMS LOCKER ADDED; BAG STORE REMOVED		
	1-E10	ELEVATED WALKWAY ADDED		
	1-K10	FORWARD DAMAGE CONTROL LOCKER ADDED		
	1-L11	1 DECK FORWARD GEOMETRY MODIFIED TO ACCOMMODATE VEHICLE FLOW AND WIDENED BOW RAMP		
	1-A12, 1-A13	RUDER/STEERING GEAR POSITIONED 350 mm OFFSET FROM SHAFT		
	1-C12, 1-C14	ENGINE ROOM SUBDIVIDED INTO FORWARD AND AFT ENGINE ROOM		
	1-B12, 1-C13	FUEL OIL DAY TANKS ADDED		
7	1-D13	MCR RELOCATED		
	1-E12, 1-E13	DOMESTIC MACHINERY COMPARTMENT ADDED		
	1-E14, 1-E16	POTABLE WATER TANKS RESIZED		
	1-F12, 1-F14	FUEL OIL TANKS RELOCATED		
	1-F12, 1-F14	BALLAST TANK ARRANGEMENT REVISED		
	1-K13, 1-F16	AUXILIARY TANKS ADDED		
	1-G4	AFT NAVIGATION MAST ADDED		
	1-A10	ESCAPE HATCH REVISED TO TRUNK WITH DOOR		
	1-A8	AFT MOORING ARRANGEMENT REVISED		
	1-B10	BERP ADDED		
8	1-B10	ESCAPE TRUNK REMOVED		
	1-B11, 1-B12	BERP REVISED; CLEAN LOCKER RELOCATED		
	1-B11, 1-B13	ESCAPE TRUNK REMOVED		
	1-B12	DAY TANK AFT BOUNDARY MOVED FWD		
	1-B15	SHACKLES ARRANGEMENT UPDATED		
	1-C13	DAY TANK AFT BOUNDARY MOVED AFT		
	1-C15	FWD ER BOTTOM TANK ARRANGEMENT REVISED		
	1-D11	HATCH HEIGHT REVISED TO 4700 mm ABL. STAIR REMOVED		
	1-D15	DOUBLE BOTTOM TANK ARRANGEMENT REVISED		
	1-D2, 1-K6	MAIN MAST REVISED TO POLE MAST		
9	1-F14, 1-F16	DOUBLE BOTTOM ADDED IN WING TANKS FR 60-75	ACN 20 MAR 23	ISA 21 MAR 23
	1-G1	PRINCIPAL PARTICULARS UPDATED		
	1-G4	HULL FORM LENGTHENED		
	1-G6	LOCKER REMOVED		
	1-G8, 1-G9	LIFERAFT CAPACITY REVISED TO SERVE CREW COMPLEMENT ONLY		
	1-H1	RESERVATIONS REMOVED		
	1-H6	BRIDGE FRONT WINDOWS REVISED		
	1-I4	SUBDIVISION BULKHEADS RELOCATED FOLLOWING HULL LENGTHENING		
	1-I6	BERPS FOR ER EQUIPMENT REMOVAL ADDED		
	1-I6, 1-C2	FORWARD ENGINE ROOM CASING FORWARD BULKHEAD MOVED FORWARD 500 mm		
10	1-K10, 1-K11	BOW RAMP CHAIN LOCKERS ADDED		
	1-K8	FORWARD MAST RELOCATED TO PORT SIDE		
	1-L8, 1-L9	FORWARD ANCHORING/MOORING/BOW RAMP WINCH ARRANGEMENT REVISED		
	ALL	CLASS NOTATIONS UPDATED		
	3	LIFERAFT QUANTITIES UPDATED	ACN 16 OCT 23	MAM 16 OCT 23
	3	OPENABLE PORT LIGHTS INDICATED		
	3	SPECIAL UNDERWATER PROTECTIVE SYSTEM INDICATED		
	3	VENDOR PROPELLER AND RUDDER ADDED		
	3	MACHINERY AND STRUCTURE BACKGROUNDS UPDATED		
	4	UPDATED BOAT CRANE BASED ON FINAL EQUIPMENT SELECTION		
11	4	UPDATED ANCHOR WINDLASSES BASED ON FINAL EQUIPMENT SELECTION		
	4	UPDATED WEDGING ANCHOR BASED ON FINAL EQUIPMENT SELECTION		
	4	UPDATED PROPELLERS BASED ON FINAL VENDOR DRAWINGS		
	4	UPDATED DOMESTIC MACHINERY COMPARTMENT ARRANGEMENT BASED ON FINAL EQUIPMENT SELECTION		
	4	ADDED GREASE TRAP IN LAVATORY SHOWER, 1 DECK PS	ACN 19 APR 24	MAM 19 APR 24
	4	ADDED PYROTECHNIC LOCKER, 03 DECK SB		
	4	ADDED SEARCHLIGHTS ON 03 AND 04 DECKS		
	4	ADDED PELORUS ON 04 DECK		
	4	INCREASED OPENABLE PORTLIGHTS TO 14 PER SIDE PER BN REVIEW COMMENTS		
	4	RESERVATIONS 3 AND 4 ADDED		